MERRILLVILLE

Utility Development & Master Plans

MS4 Annual Meeting 2014

Matthew Lake, M.S., CMS4S - Executive Director

Darren Olson, P.E., CFM - Senior Project Manager

Stormwater Utility Development

MERRILLVILLE STORMWATER UTILITY

We all live in a watershed!

Regulations

Merrillville and many other municipalities are required to have permit coverage through the Indiana Department of Environmental Management to comply with 327IAC15-13 "Rule 13". This regulates Municipal Separate Storm Sewer Systems (MS4s). MS4s are defined as a conveyance or system of conveyances owned by a state, city, town, or other public entity that discharges to waters of the United States and is designed or used for collecting or conveying stormwater. The purpose of this regulation is to minimize polluted stormwater runoff to protect lakes, rivers and streams.

TOWN OF MERRILLVILLE
DEC. 30 1971

STORMWATER UTILITY

Benefits

- Maintenance and upgrade of existing storm drain systems.
- Development of drainage plans.
- Implement flood control projects.
- Comply with state and federal mandated regulations.
- Construction of major capital improvements.
- Implement public education/outreach and participation.
- Detect and enforce illicit discharges.
- Ensure appropriate construction site runoff controls.
- Manage post-construction BMP program.
- Pollution prevention for municipal operations.

Did You Know....

- Polluted runoff is the nation's largest greatest threat to clean water.
- Only 1% of the Earth's water is suitable for drinking.
- Lake Michigan is the 6th largest freshwater lake in the world.
- Everyone lives in a watershed (our water drains to Lake Michigan).
- 1" of rain per acre = 27,154 gallons.
- 1" of rain in Merrillville = over 578 million gallons.
- Plants filter water and improve water quality.
- 1 gallon of oil can contaminate up to 1 million gallons of water.
- Storm inlets drain to open waterways, not treatment plants.
- The water you drink is affected by stormwater runoff.

You Can Help Make a Difference!

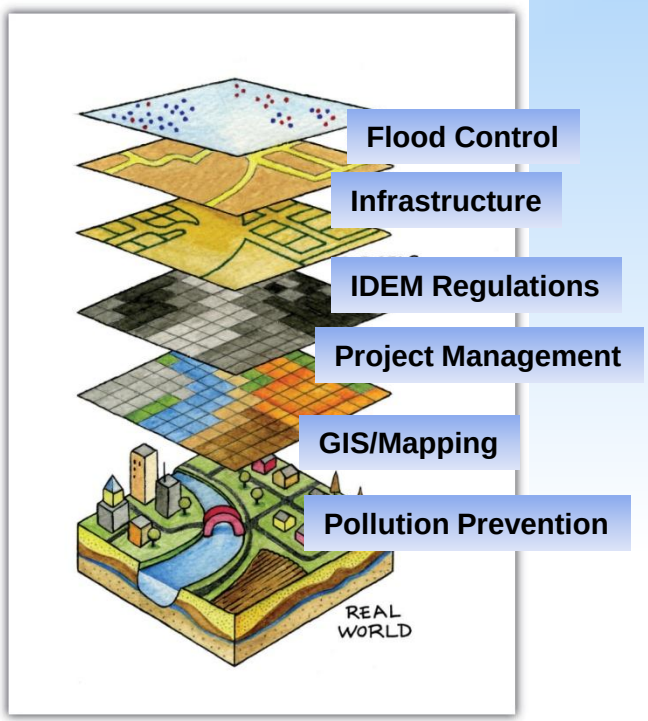
- Plant a rain garden or trees in your yard.
- Keep leaves, grass and debris out of the streets and storm drains.
- Don't over fertilize your lawn.
- Install a rain barrel to harvest rain water.
- Properly dispose unwanted automotive fluids.
- Volunteer to help maintain green projects.
- Report stormwater polluters.
- Remember **"only rain in the drain!"**

Stormwater Management

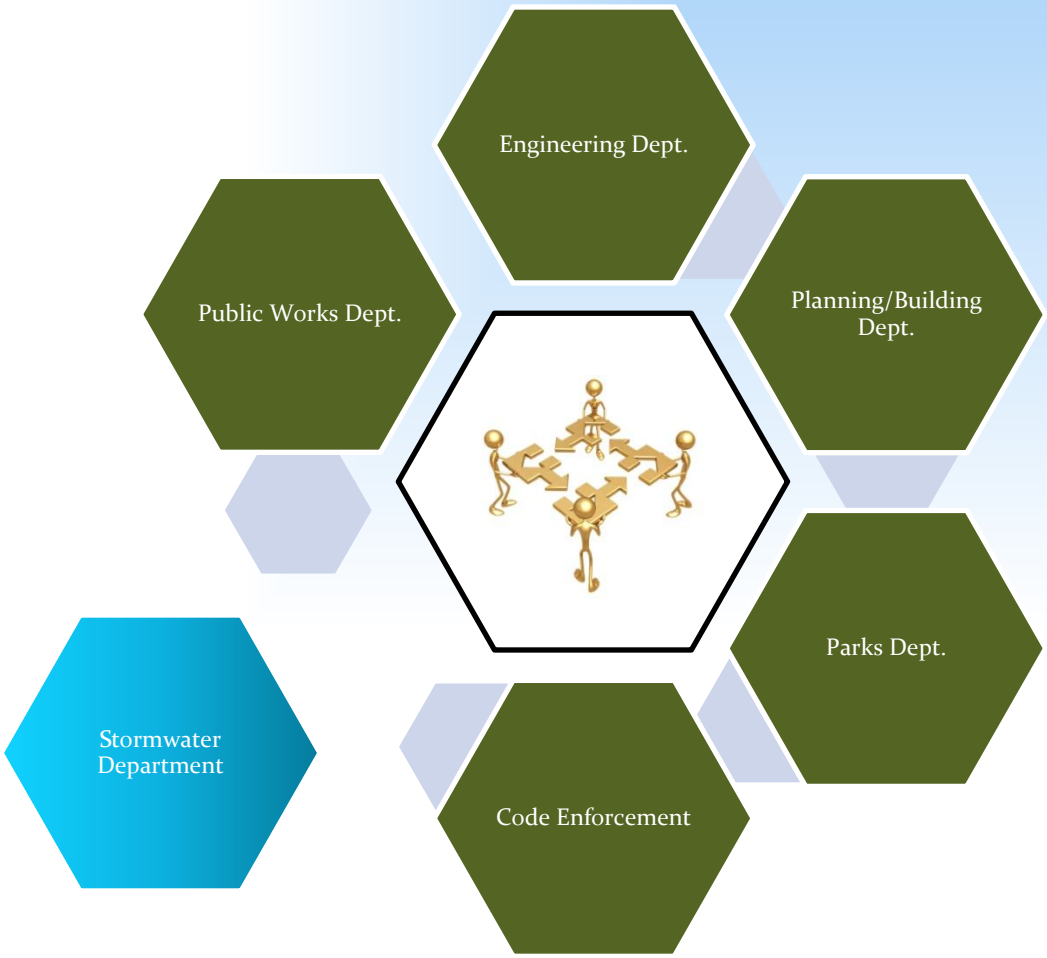
Managing the quantity and quality of stormwater is termed, "Stormwater Management.“ – Layers of Responsibility

Stormwater management includes both technical and institutional aspects, including:

- control of flooding and erosion;
- control of hazardous materials to prevent release of pollutants into the environment (source control);
- planning and construction of stormwater systems so contaminants are removed before they pollute surface waters or groundwater resources;
- acquisition and protection of natural waterways or rehabilitation;
- building "soft" structures such as ponds, swales or wetlands or Green Infrastructure solutions to work with existing or "hard" drainage structures, such as pipes and concrete channels;
- development of funding approaches to stormwater programs potentially including stormwater user fees and the creation of a stormwater utility;
- development of long-term asset management programs to repair and replace aging infrastructure;
- revision of current stormwater regulations to address comprehensive stormwater needs;
- enhancement and enforcement of existing ordinances to make sure property owners consider the effects of stormwater before, during and after development of their land;
- education of a community about how its actions affect water quality, and about what it can do to improve water quality; and
- planning carefully to create solutions before problems become too great



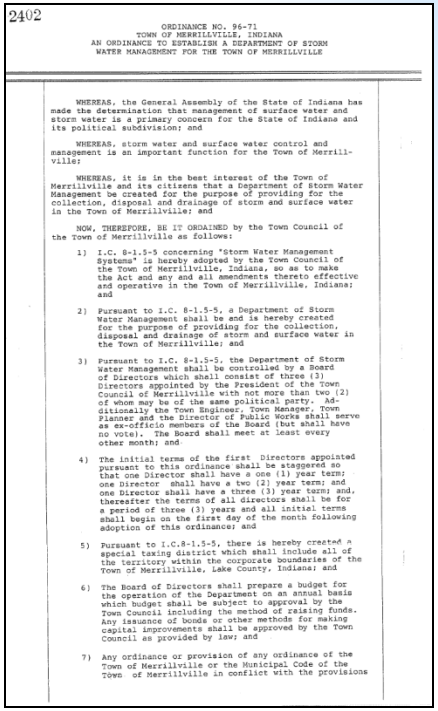
Stormwater Management Programs



- Most SW programs are extensions of an existing department
- Few communities have actual Stormwater Departments
- Merrillville SW initially was a utility on paper and evolved into a defined department

Stormwater Utilities

- A stormwater utility is responsible for <u>funding</u> the operation, construction and maintenance of stormwater management devices, for stormwater system planning, and management.



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ORDINANCE NO. 96-71
TOWN OF MERRILLVILLE, INDIANA
AN ORDINANCE TO ESTABLISH A DEPARTMENT OF STORM WATER MANAGEMENT FOR THE TOWN OF MERRILLVILLE

WHEREAS, the General Assembly of the State of Indiana has made the determination that management of surface water and storm water is a primary concern for the State of Indiana and its political subdivision; and

WHEREAS, storm water and surface water control and management is an important function for the Town of Merrillville;

WHEREAS, it is in the best interest of the Town of Merrillville and its citizens that a Department of Storm Water Management be created for the purpose of providing for the collection, disposal and drainage of storm and surface water in the Town of Merrillville; and

NOW, THEREFORE, BE IT ORDAINED by the Town Council of the Town of Merrillville as follows:

1) I.C. 8-1.5-5 concerning "Storm Water Management Systems" is hereby adopted by the Town Council of the Town of Merrillville, Indiana, so as to make the Act and any and all amendments thereto effective and operative in the Town of Merrillville, Indiana; and

2) Pursuant to I.C. 8-1.5-5, a Department of Storm Water Management shall be and is hereby created for the purpose of providing for the collection, disposal and drainage of storm and surface water in the Town of Merrillville; and

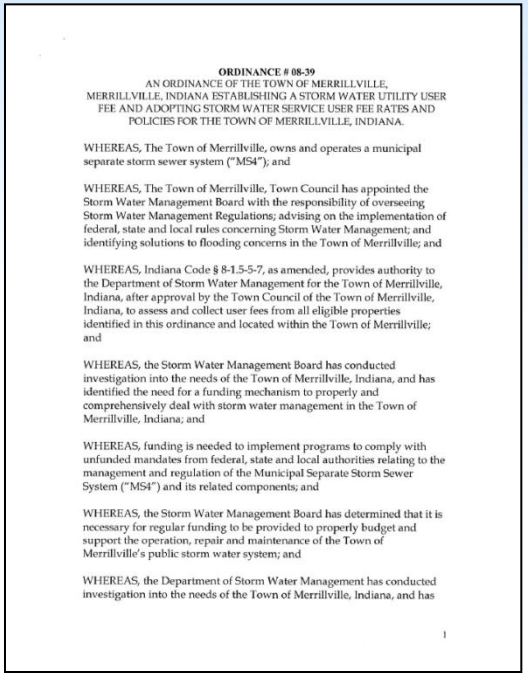
3) Pursuant to I.C. 8-1.5-5, the Department of Storm Water Management shall be controlled by a Board of Directors which shall consist of three (3) Directors appointed by the President of the Town Council of Merrillville with not more than two (2) of whom may be of the same political party. Additionally the Town Engineer, Town Manager, Town Planner and the Director of Public Works shall serve as ex-officio members of the Board (but shall have no vote). The Board shall meet at least every other month; and

4) The initial terms of the first Directors appointed pursuant to this ordinance shall be staggered so that one Director shall have a one (1) year term; one Director shall have a two (2) year term; and one Director shall have a three (3) year term; and, thereafter the terms of all directors shall be for a period of three (3) years and all initial terms shall begin on the first day of the month following adoption of this ordinance; and

5) Pursuant to I.C.8-1.5-5, there is hereby created a special taxing district which shall include all of the territory within the corporate boundaries of the Town of Merrillville, Lake County, Indiana; and

6) The Board of Directors shall prepare a budget for the operation of the Department on an annual basis which budget shall be subject to approval by the Town Council including the method of raising funds. Any issuance of bonds or other methods for making capital improvements shall be approved by the Town Council as provided by law; and

7) Any ordinance or provision of any ordinance of the Town of Merrillville or the Municipal Code of the Town of Merrillville in conflict with the provisions



ORDINANCE # 08-39
AN ORDINANCE OF THE TOWN OF MERRILLVILLE, MERRILLVILLE, INDIANA ESTABLISHING A STORM WATER UTILITY USER FEE AND ADOPTING STORM WATER SERVICE USER FEE RATES AND POLICIES FOR THE TOWN OF MERRILLVILLE, INDIANA.

WHEREAS, The Town of Merrillville, owns and operates a municipal separate storm sewer system ("MS4"); and

WHEREAS, The Town of Merrillville, Town Council has appointed the Storm Water Management Board with the responsibility of overseeing Storm Water Management Regulations; advising on the implementation of federal, state and local rules concerning Storm Water Management; and identifying solutions to flooding concerns in the Town of Merrillville; and

WHEREAS, Indiana Code § 8-1.5-5-7, as amended, provides authority to the Department of Storm Water Management for the Town of Merrillville, Indiana, after approval by the Town Council of the Town of Merrillville, Indiana, to assess and collect user fees from all eligible properties identified in this ordinance and located within the Town of Merrillville; and

WHEREAS, the Storm Water Management Board has conducted investigation into the needs of the Town of Merrillville, Indiana, and has identified the need for a funding mechanism to properly and comprehensively deal with storm water management in the Town of Merrillville, Indiana; and

WHEREAS, funding is needed to implement programs to comply with unfunded mandates from federal, state and local authorities relating to the management and regulation of the Municipal Separate Storm Sewer System ("MS4") and its related components; and

WHEREAS, the Storm Water Management Board has determined that it is necessary for regular funding to be provided to properly budget and support the operation, repair and maintenance of the Town of Merrillville's public storm water system; and

WHEREAS, the Department of Storm Water Management has conducted investigation into the needs of the Town of Merrillville, Indiana, and has

1

Funding Mechanism

Stormwater Program Funding

- Many Indiana entities have stormwater fees…
  - Average = $4.70
- Merrillville established a modest fee
  - Ex: residential $5/month
  - Based on land use

- Stormwater master planning: making better use of limited dollars by targeting high priority stormwater projects.

Flat Fees Based on Property Code

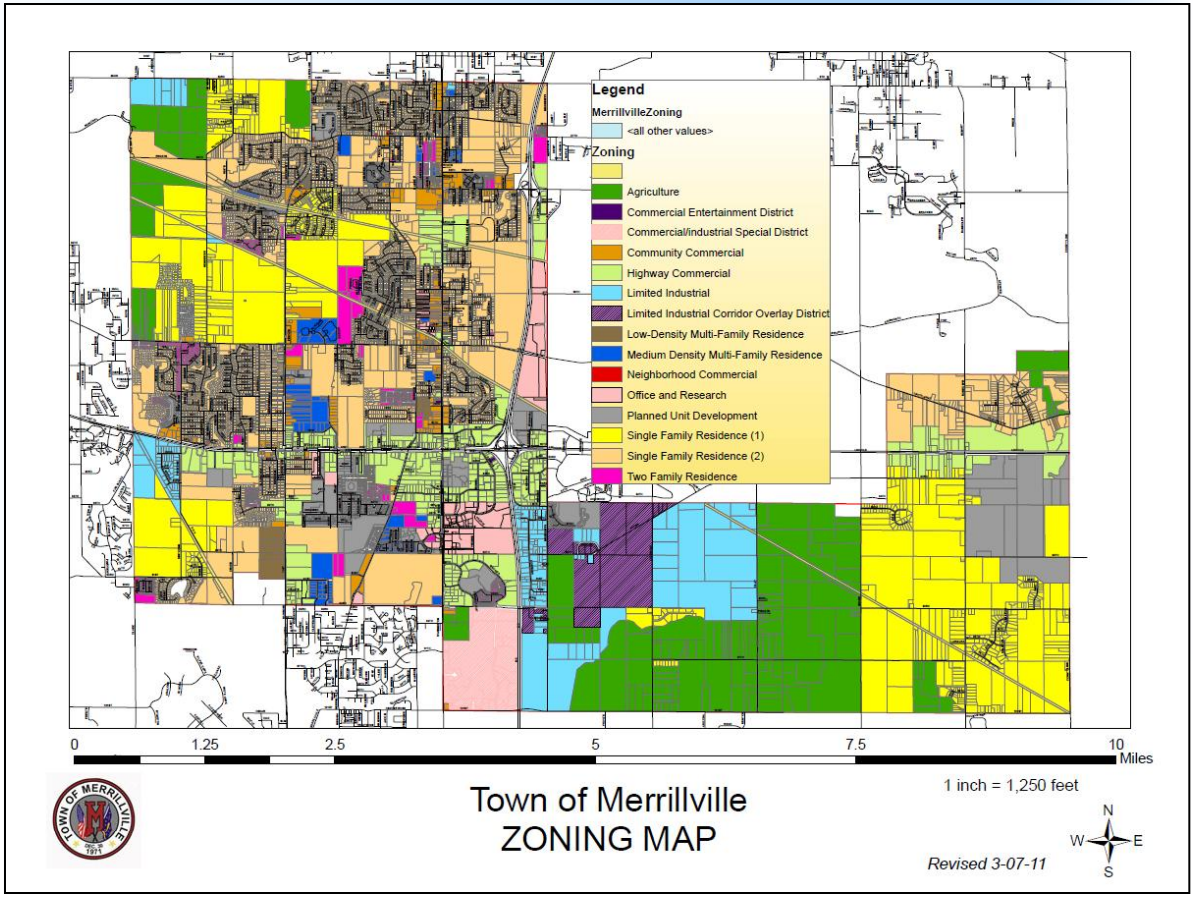
100-199 Agricultural	20 acres or less = $2.50 per month Greater than 20 acres = $.125 per acres
300 Industrial Vacant Land	20 acres or less = $2.50 per month Greater than 20 acres = $.125 per acres
330-399 Industrial	$35.00
400 Commercial Vacant Land	20 acres or less = $2.50 per month Greater than 20 acres = $.125 per acres
401 Commercial Apartment 4-19 Units	$15.00
402 - 499 All commercial including apartment buildings over 19 units	$35.00
500-509 Residential Vacant Land	.25 acres or less = No Charge .251 acres to 20 acres = $2.50 Greater than 20 acres = $.125 per acres
510 - 545 - Residential Single Family, Duplex and Three Unit including excess acreage	$5.00
550 - Residential Condo	$5.00
599 Other Residential Structure	$5.00
650 – Board of Education	$15.00
600, 610, 620, 621, 622, 630, 640, 645, 660, 661, 662, 665, 669	State, county, municipal and other exempt properties are not charged.
670 – Exempt private academy / college	$15.00
680, 685, 686 Charitable, religious and churches	$15.00
690 - Cemetery	6.66 acres or less = $2.50 per month Greater than 6.66 acres = $.375 per acres.
699 Other Exempt Properties	$0.00
820 - Heat and Power Utilities	$35.00
821 - State Assessed LHP	$25.00
830 - 841 - Railroad and Pipeline	20 acres or less = $2.50 per month Greater than 20 acres = $.125 per acres
850-871 Sewage, Phone and water utilities	$35.00

The legal documents to support this unfunded mandate are:

- U.S. Environmental Protection Agency - Phase II of the National Pollution Discharge Elimination System program (FR Doc. 99–29181) authorized by the 1972 amendments to the Clean Water Act
- Indiana Department of Environmental Management – Rule 13 (327 IAC 15-13)

Stormwater Program Funding

- Urban and Agriculture land use generate non-point source pollution.
- The older urban sections of town require more retrofits.



Management Goals

- First goal on my list back in 2011 was to update the Stormwater Master Plan.

TOWN OF MERRILLVILLE STORMWATER UTILITY

13 West 73rd
Merrillville, Indiana 46410

STORMWATER MANAGEMENT GOALS

- Update Stormwater Master Plan (last updated in 1987)
- Comprehensive list of priority projects with estimated costs
- Mapping of all Stormwater utility infrastructure (Arc GIS)
- Development of Stormwater Atlas
- Stormwater easement identification and procurement project
- Implement routine maintenance crew and training to perform standard clearing, cleaning and snagging
- Work with summer interns on special projects for management and maintenance
- Assessment of all Detention Facilities and Plan for maintenance/responsibilities
- Setup comprehensive plan review group for stormwater pollution prevention plan submittals and permitting
- Target outfall testing and continue coordinating with IDEM on standardized protocols
- Work with IDEM Rule 6 Coordinator on Industrial facility assessments and compliance
- Detail the enforcement protocol for Stormwater violations and fine collection
- New Stormwater Utility Center
- Annual revisions of ordinance to refine and update the standards including Low Impact Development requirements
- Initiate special outreach campaign with additional local brochures, materials and events
- Setup standard protocol for AS-built checks for post-construction BMPs

Creating a Functional Stormwater Utility

Stormwater Staff “Team”

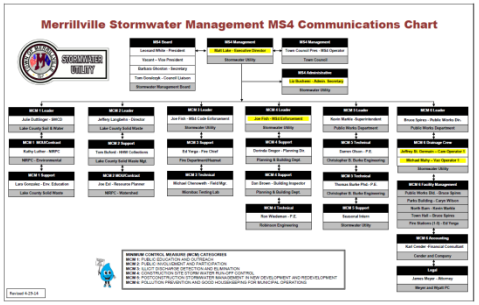
Management = Executive Director

Enforcement/Field Superintendent = Compliance Officer

Administrative = Secretary

Drainage Crew = Operator 1

Drainage Crew = Operator 2



Stormwater Equipment

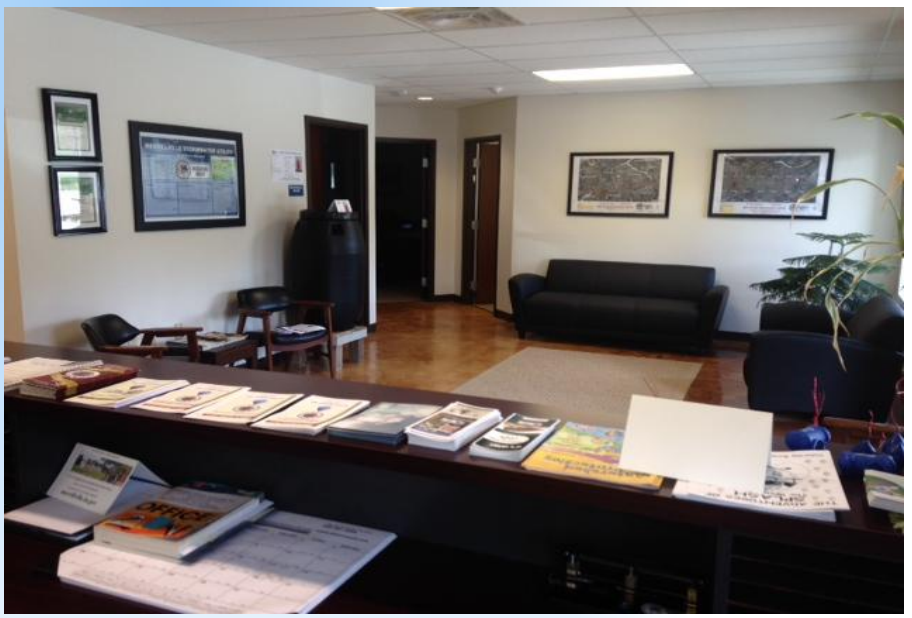
- Jet Vac
- Camera Truck
- Backhoe
- Small Dump Truck
- Large Dump Truck
- Street Sweeper
- ATV

DATE	V or E	COMPANY	DESCRIPTION	MODEL #	FUEL #	VEHICLE ID # / SERIAL #	AMOUNT
3/26/2009	V	Merrillville Police Department	Matt's 2003 Blue Chevrolet	4-door Impala	#809	[illegible]	?
6/1/2010	E	Ben Meadows	GPS Garmin Map 76			Serial #22172327	$189.05
6/10/2010	E	Precise Computers, Inc. (219) 793-8703-Steve	Matt's NEC Computer Monitor	EA231WMI-BK(1)		Serial #07106456NA	$310.00
8/28/2010	V	Bloomington Ford, Inc.; Phone: (812) 331-2200	Bud's 2010 White Ford Truck	F150, 4X4	#801	VIN 1FTEW1E88AFD19340	$27,860.25
9/8/2010	E	Adams Remco; (219) 662-5866- Mark	Matt's Lexmark Printer	X5736de		R3247	$4,500.00
1/5/2011	V	Maxim Power Sports, (219) 942-0598-Doug	2011 Yamaha 700 EPS ATV	YFM7FGPAL		[illegible]	$10,552.00
1/5/2011	V	Valpo Trailer, Inc.	Trailer, spare tire & wheel	U.S. Cargo		[illegible]	$1,783.40
1/11/2011	V	Mattracks, Inc., Karlstad, MN, (218) 436-7000	Tracks for Yamaha 700 EPS ATV	ATV System-XT			$5,951.00
1/18/2011	V	Warsaw Outdoor Power Equipment	2010 Argo Avenger	Model 750 EFI		[illegible]	$20,465.51
		(574) 267-4858 (Cindy & Matt)					
2/14/2011	E	Precise Computer, Inc.	Matt's Dell Optiplex 380 CPU Unit, keyboard and mouse			Service Tag #CCLPRL1	$649.00
2/14/2011	E	Precise Computers, Inc.	Liz's Dell Computer Monitor			[illegible]	$1,171.00
2/14/2011	E	Precise Computers, Inc.	Liz's Dell Computer Keyboard			[illegible]	(with monitor)
2/14/2011	E	Precise Computers, Inc.	Liz's Dell Computer Hard Drive			[illegible]	(with monitor)
2/15/2011	E	Precise Computer, Inc.	Matt's Dell Computer Keyboard			[illegible]	?
3/1/2011	E	Maxim Powersports	Plastic storage toolbox for ATV	[illegible]			$199.95
4/3/2011	V	[illegible] Blue Water Marine, Inc	2011 Mercury outboard motor for Argo	[illegible]		[illegible]	$2,350.00
3/6/2011	V	Brown Equipment Co., Inc.	2011 Dual Gutter Broom St. Sweeper	John Deere Allianz	#805	[illegible]	$159,550 w/$25,000 trade in
12/29/2010	V	McCann Industries, Inc.	2011 Loader/Backhoe	Case 580SN	#807	[illegible]	$75,200 w/$12,000 trade in
3/11/2011	V	Vactor Manufacturing, Inc./Standard Equipment	2012 Freightliner Sewer Jet/Vac Truck	M2 106 Heavy Duty	#806	[illegible]	$326,323 w/$33,000 trade in
5/24/2011	V	Mike Anderson Chevrolet	Kevin's 2011 Chevrolet Pickup Truck	Colorado LT		[illegible]	$21,102.00
6/9/2011	E	Precise Computers, Inc.	Lenovo ThinkPad laptop for comp. off.	[illegible]		[illegible]	$585.00
6/13/2011	E	McShane's	Liz's Brother typewriter	ML 100 Standard		[illegible]	$339.99
8/15/2011	E	B & H Technical Services, Inc.	Oce plotter-printer/scanner	Colorwave 300		[illegible]-printer	$35,750.00
						[illegible] scanner	(w/$500 trade-in)
11/17/2011	V	Truck City of Gary, Inc.	2012 Freightliner Dump Truck		#803	[illegible]	$152,732.00
1/23/2012	V	Brown Equipment Co., Inc.	2012 Cues Camera Truck System	Ford E-450	#810	[illegible]	$170,500.00
2/8/2012	V	Merrillville Police Department (107,914 miles)	2005 Ford Crown Vic sedan for compliance officer		#802	[illegible]	$4,100.00
4/4/2012	E	Office Depot	"All In One" Jet printer for comp. off.			[illegible]	$360.00
5/25/2012	V	Merrillville Police Department (126,000 miles)	2007 Crown Vic sedan for Executive Director			[illegible]	$5,000.00
5/30/2012	E	Office Depot	HP laptop & carry case for intern/ex.dir	[illegible]		[illegible]	$635.00

Stormwater Resource Center

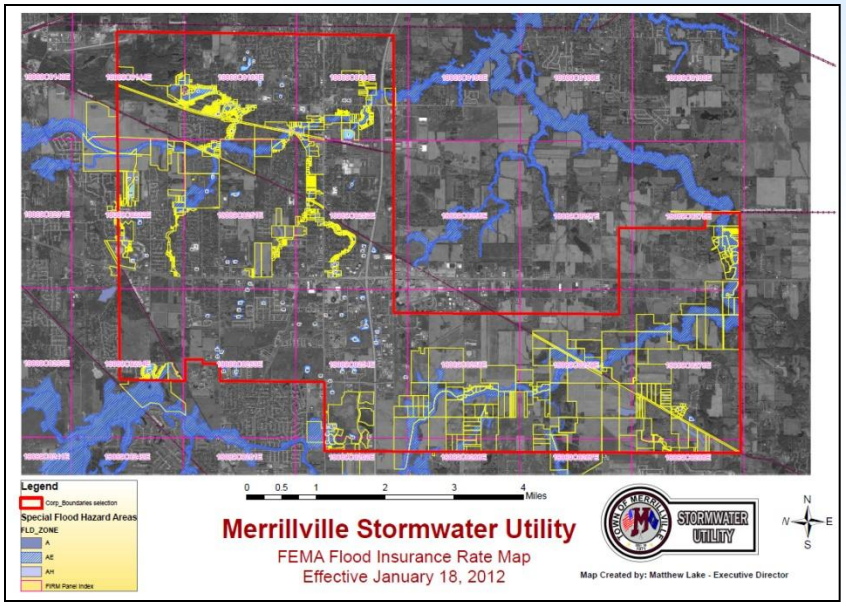
- Serves as operations, management and educational facility for stormwater management

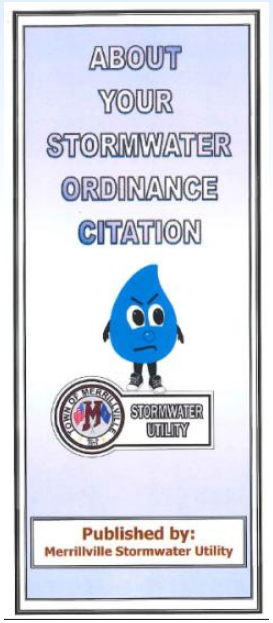
Stormwater Resource Center

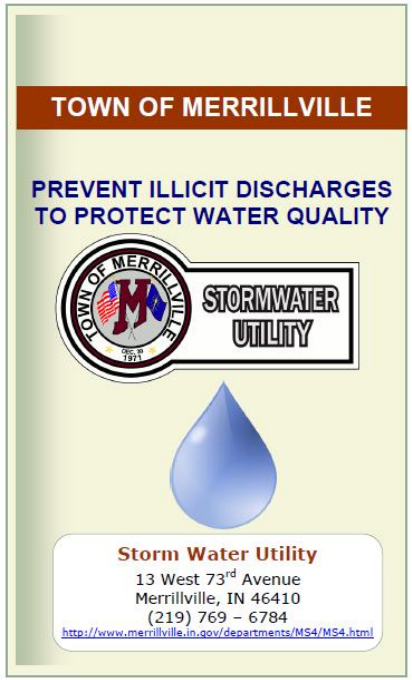


Defining Responsibilities

- Given the broad spectrum that encompasses stormwater management there are overlapping responsibilities with other departments…
  - Streets (where asphalt roadway meets concrete curb or ditch)
  - Parks/Environmental (designed bioremediation, rain gardens, wetland enhancement etc…)
  - Planning (SWP3, Excavation Permits, Construction in floodway)
  - Code Enforcement (pollutants, waterway/detention impacts, sediment etc…)
  - GIS/Mapping (FEMA Maps, Watersheds, SW infrastructure etc…)

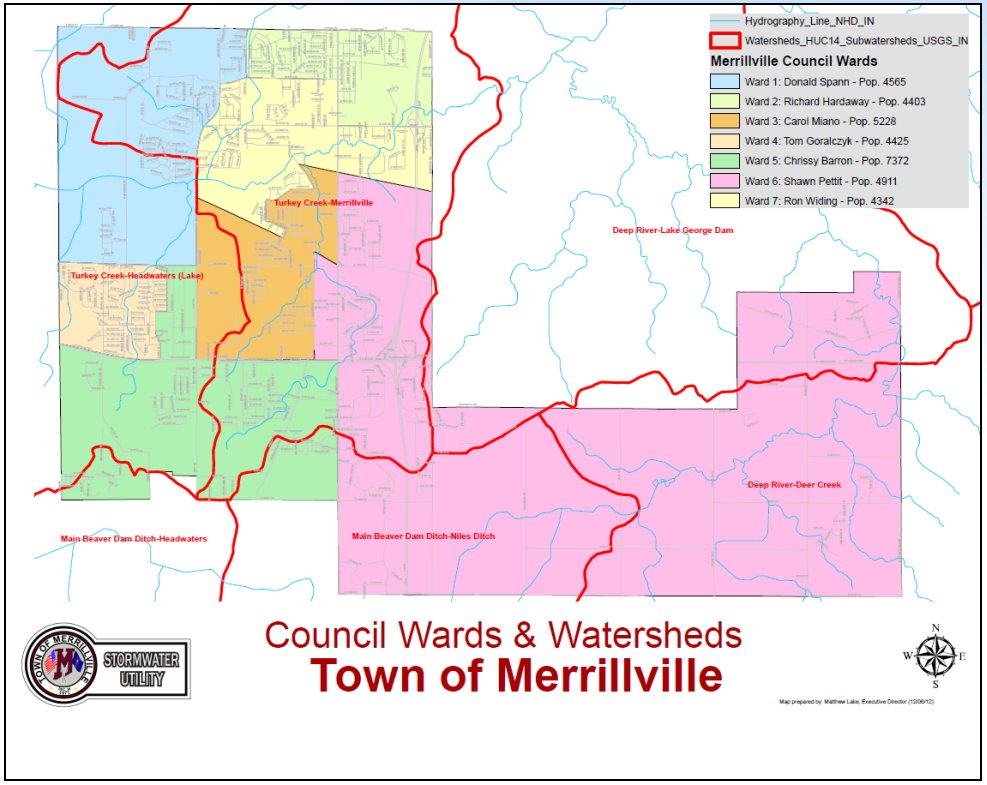


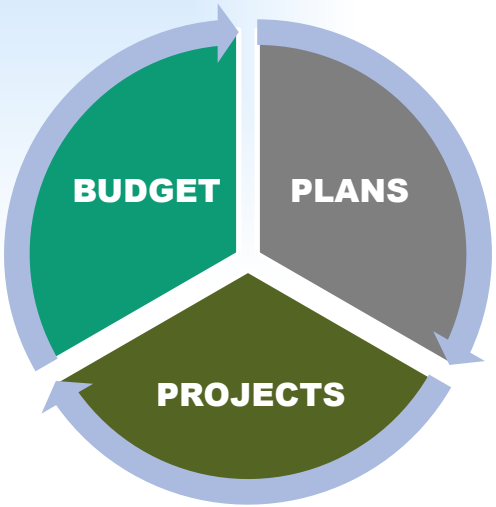




Prioritization?

- Constituents pay a fee for SW Management Service
- Fee Ordinance restricts and defines where you can spend SW revenue
- Utilities are only 3-5 years old and problems have been around for 50 or more years….
- **<u>Stormwater does not follow Political Boundaries!</u>**





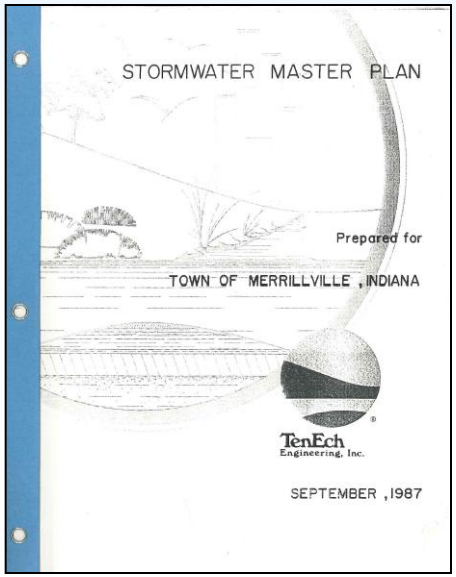
Stormwater Master Plan

September 2008 Storm Event

- 9 inches of rain in 48 hours
- Agency Coordination
  - Town of Merrillville
  - Lake County Surveyor's Office
  - Indiana Department of Transportation

Stormwater Master Plan

- Project Goals
  - Update 1987 Master Plan
  - Incorporate stormwater quality
  - Modular plan with drainage studies for each sub-watershed area identifying proposed improvements and recommendations "Grant –Ready"
  - <u>All data will be part of a geodatabase</u>
  - Project prioritization matrix
  - Public Involvement
  - Capital Planning



Study Areas

- Focus on the urbanized areas of town.
- 9 Sub-Watersheds
- Delineation per watercourse

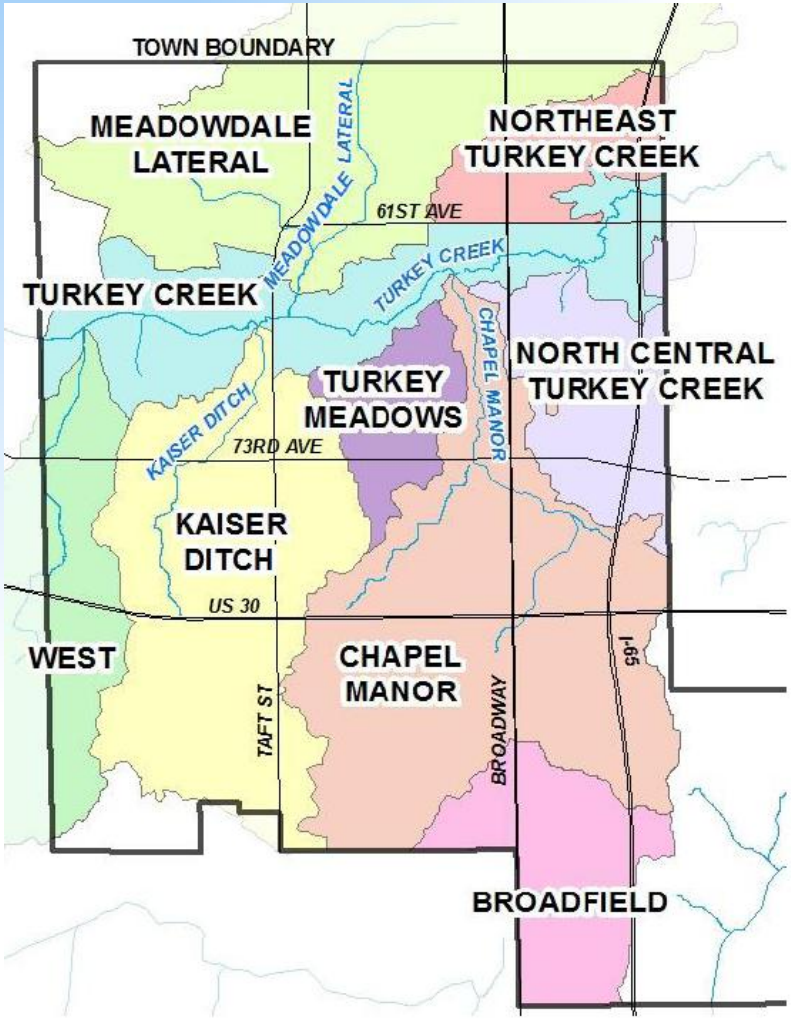


Figure 2. Study Areas by Watershed

Sub-watershed Study

- **GIS Data Collection**
  - Water Quality
  - Landuse
  - Parcel Data
  - Topography
  - FEMA
  - Drainage Complaints
  - Drainage system survey
- **H&H Modeling**
- **Development of Proposed Flood Control/WQ Projects**
- **Cost Estimates**

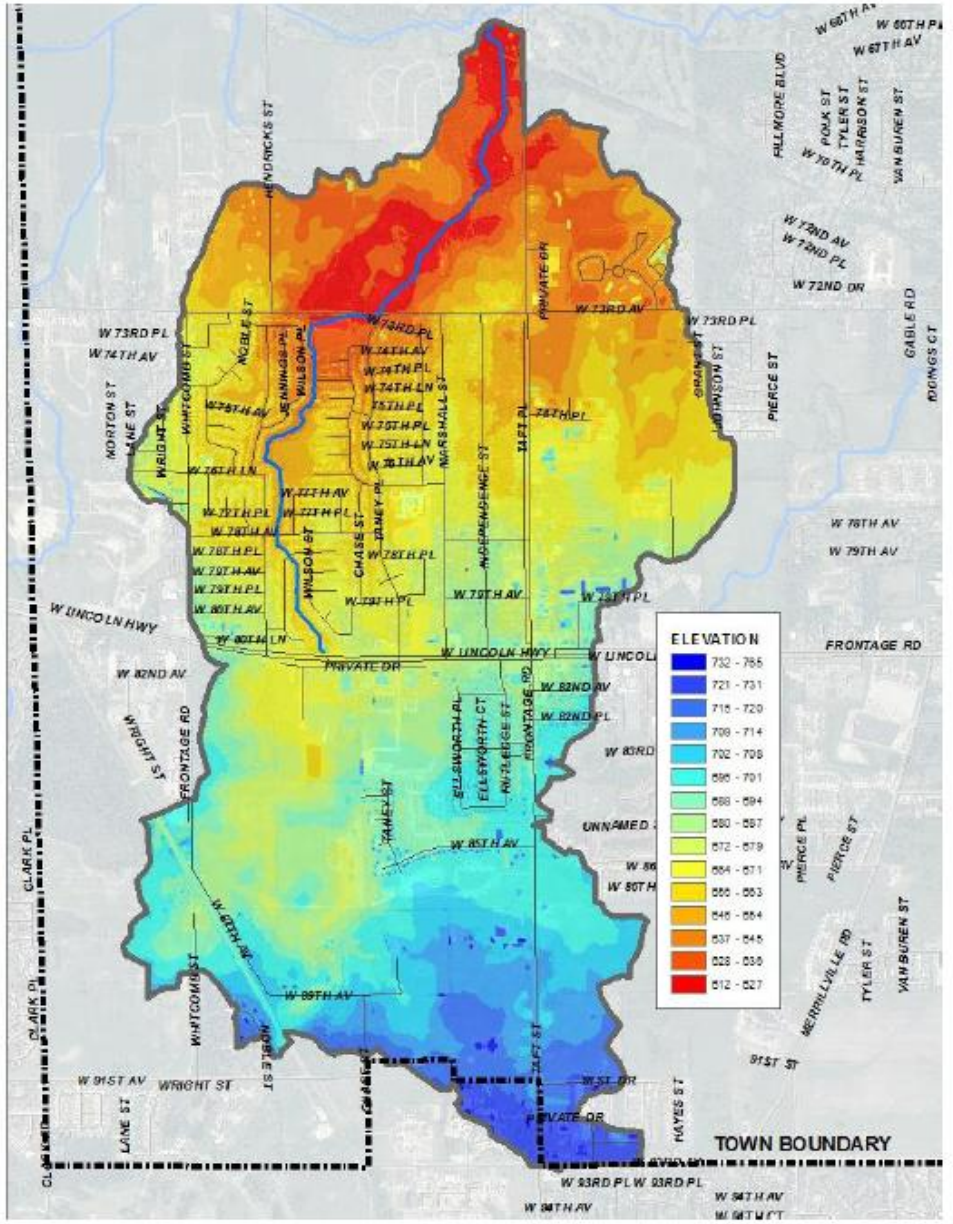


Figure 3. Kaiser Ditch Watershed

Land Use Assessment

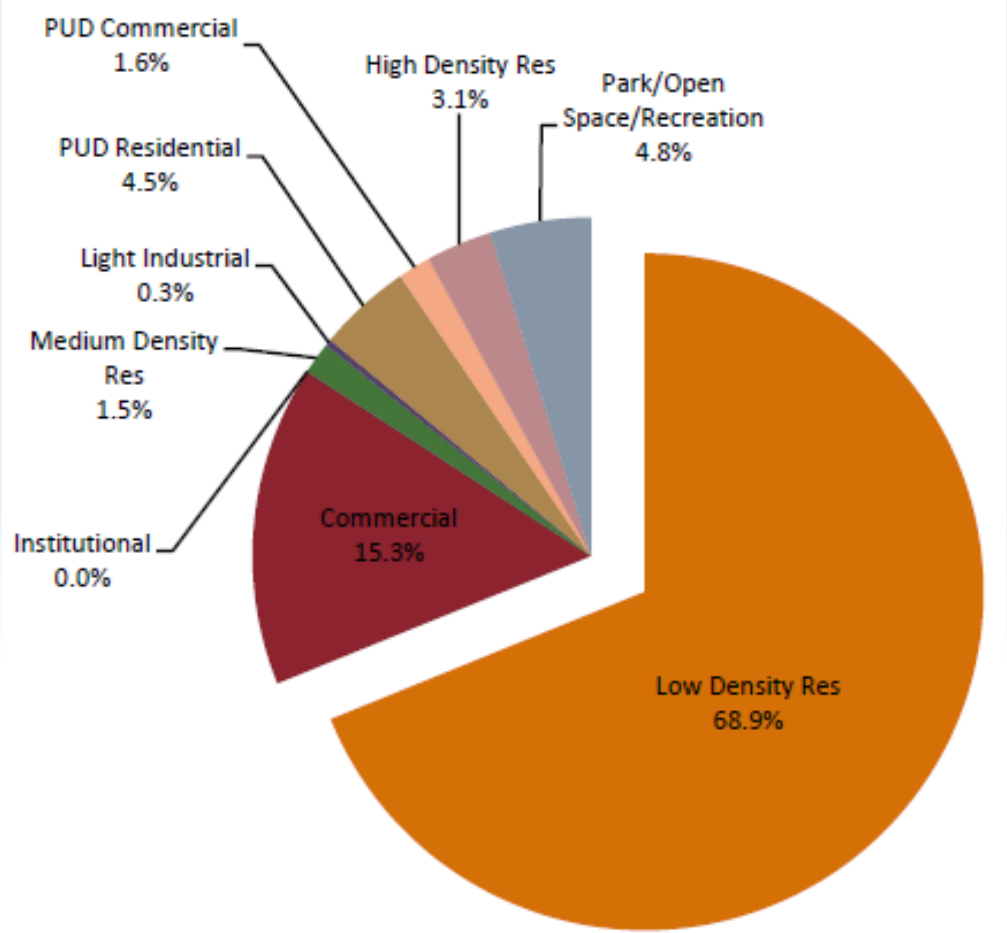
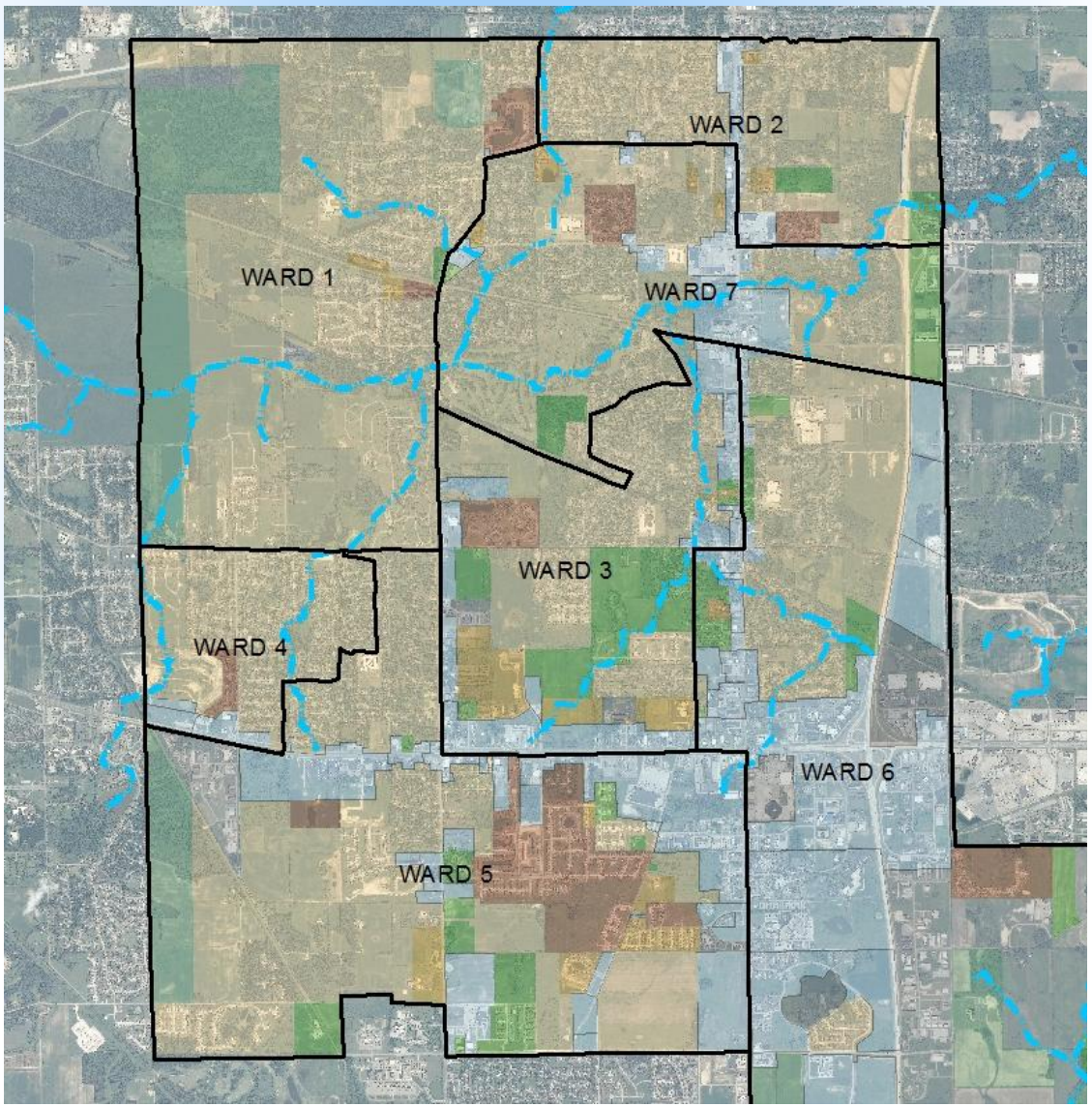


Figure 4. Kaiser Ditch Watershed Land Use

Land Use Assessment



Revenue Contribution

- **Overall Utility Contribution**
  - Breakdown by Ward
  - Breakdown by Sub-watershed

3.3 KAISER DITCH BY WARD AND UTILITY FEE

The Kaiser Ditch watershed consists of 4 Wards (**Figure 7**) and contributes 19% of the Town's yearly stormwater Utility fee, respectively. This information is based on the Town's 2013 stormwater utility fee and is a function of the land use within the watershed. There are 2290 residential parcels (approximately 89%) within the Kaiser Ditch Watershed. This information can be accessed under the Land Use and Cover group layer in the master GIS database.

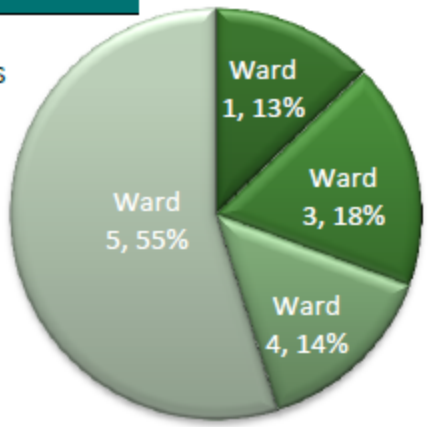
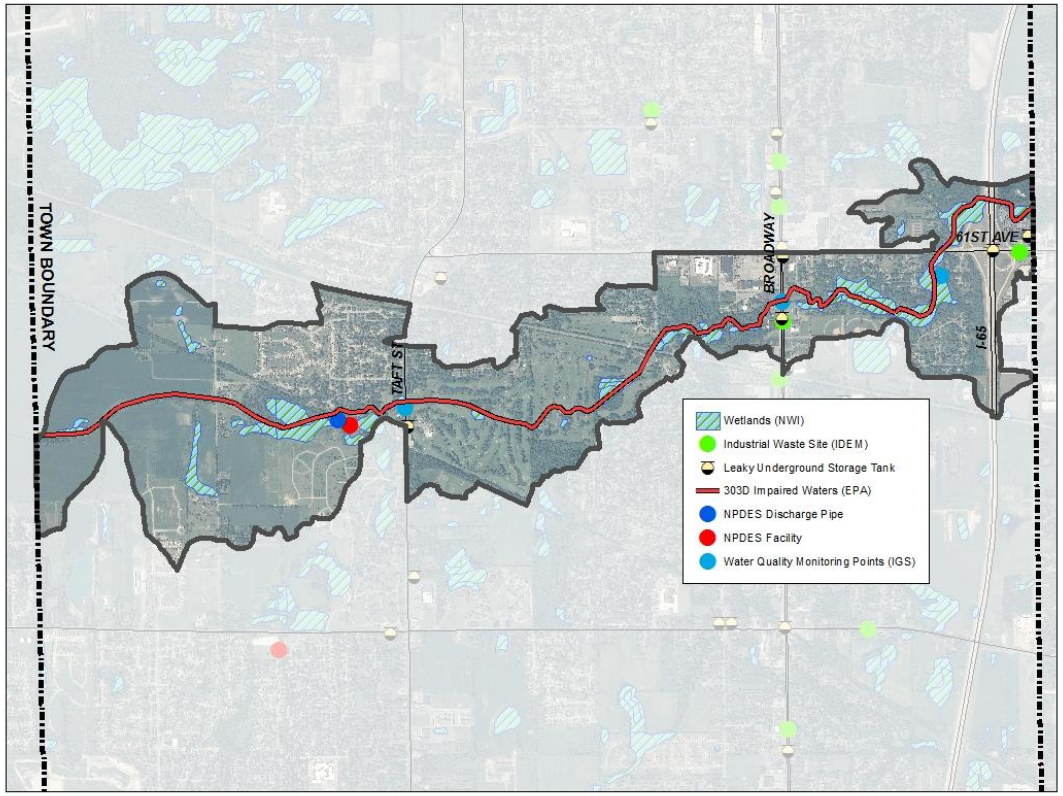


Figure 7. Kaiser Ditch by Ward

Stormwater Quality

Land Use	TSS	TP	TKN	NH3-N	BOD	COD	Lead	Zinc	Cu
Commercial	1000	1.5	6.7	1.9	62	420	2.7	2.1	0.4
Parking Lot	400	0.7	5.1	2.0	47	270	0.8	0.8	0.04
High Density Residential	420	1.0	4.2	0.8	27	170	0.8	0.7	0.03
Medium Density Residential	190	0.5	2.5	0.5	13	72	0.2	0.2	0.14
Low Density Residential	10	0.04	0.03	0.02	NA	NA	0.01	0.04	0.01
Freeway/Interstate	880	0.9	7.9	1.5	NA	NA	4.5	2.1	0.37
Industrial	860	1.3	3.8	0.2	NA	NA	2.4	7.3	0.50
Park/Open Space	3	0.03	1.5	NA	NA	2.0	0.0	NA	NA
Construction	6000	80	NA	NA	NA	NA	NA	NA	NA

Table 5. Typical Pollutant Loadings from Runoff by Urban Land Use (lbs/acre-yr). ***EPA, Honer et al, 1994***



Dataset	Agency
303D Impaired Waters	EPA
Active Solid Waste Site	EPA
Confined Feeding Operations	IDEM
Corrective Action Site	IDEM
Dams	IDNR
Impaired Lakes	IDEM
Leaky Underground Storage Tank	IDEM
NPDES Discharge Pipe	EPA
NPDES Facility	EPA
Open Dumps	IDEM
Sediment Inventory	EPA
Superfund Sites	EPA
Industrial Waste Site	IDEM
Waste Seepage Sites	IDEM
Waste Tire Sites	IDEM
Water Quality Monitoring Points	IGS
Water Quality Observations	EPA
Water Quality Statistics	EPA

Table 6. Water Quality Datasets

Hydrologic & Hydraulic Modeling

- **FIS Regulatory Models**
  - Review
  - Evaluation
- **Master Plan Models**
  - Unsteady HEC-RAS
  - XP-SWMM
  - Bulletin 71 Rainfall
  - Current H&H Methodologies
- **Existing Conditions Inundation Areas**
  - Baseline for Projects
  - Drainage Problem areas for development

Watershed	Regulatory Model	SWMP Model
Kaiser Ditch	HEC-2	XP-SWMM
Meadowdale Lateral	HEC-2	HEC-RAS
Chapel Manor	HEC-2	XP-SWMM
West	Unstudied	XP-SWMM
Turkey Meadows	Unstudied	XP-SWMM
North Central Turkey Creek	Unstudied	XP-SWMM
Broadfield	Unstudied	XP-SWMM
[1]Turkey Creek	HEC-RAS	HEC-RAS
Northeast Turkey Creek	Unstudied	XP-SWMM

[1]Modeling has not been modified

Table 3. Analysis by Watershed

Watershed	Hydrologic Soil Group			
	A	B	C	D
Agricultural	62	71	78	81
Commercial	89	92	94	95
High Density Residential	70	85	90	92
Institutional	70	85	90	92
Light Industrial	81	88	91	93
Low Density Residential	51	68	79	84
Medium Density Residential	61	75	83	87
Mixed Use	70	85	90	92
Office	81	88	91	93
Park/Open Space	49	69	79	84
Woody Wetlands	25	55	70	77
Vacant	49	69	79	84

Table 4. Land Use and RCN Summary

Known Roadway Overtopping

- Input from Police & Fire Departments

Location
West tributary between US 30 and Jennings Place
East tributary between US 30 and 79th Place,
Restrictive culverts along east tributary at 79th, 78th , 77th and 73rd
Along Taney Place, 77th Avenue to 79th Place
Kaiser Ditch immediately upstream of 73rd Avenue
Independence Street near 75th Place west of Taft Street (localized low area)
Between US 30 and 78th Avenue
Taft Street south of 85th Avenue
Areas of erosion downstream of 79th Place (eastern) downstream of 78th (western)

Table 8. Kaiser Ditch Watershed – Proposed Improvements

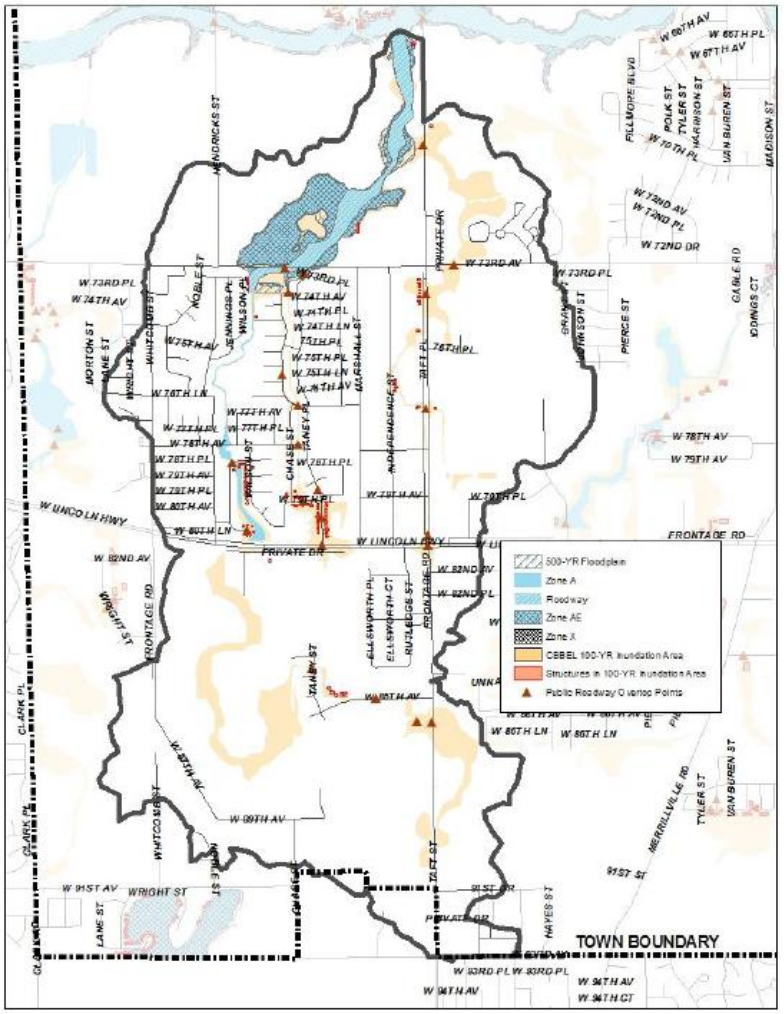


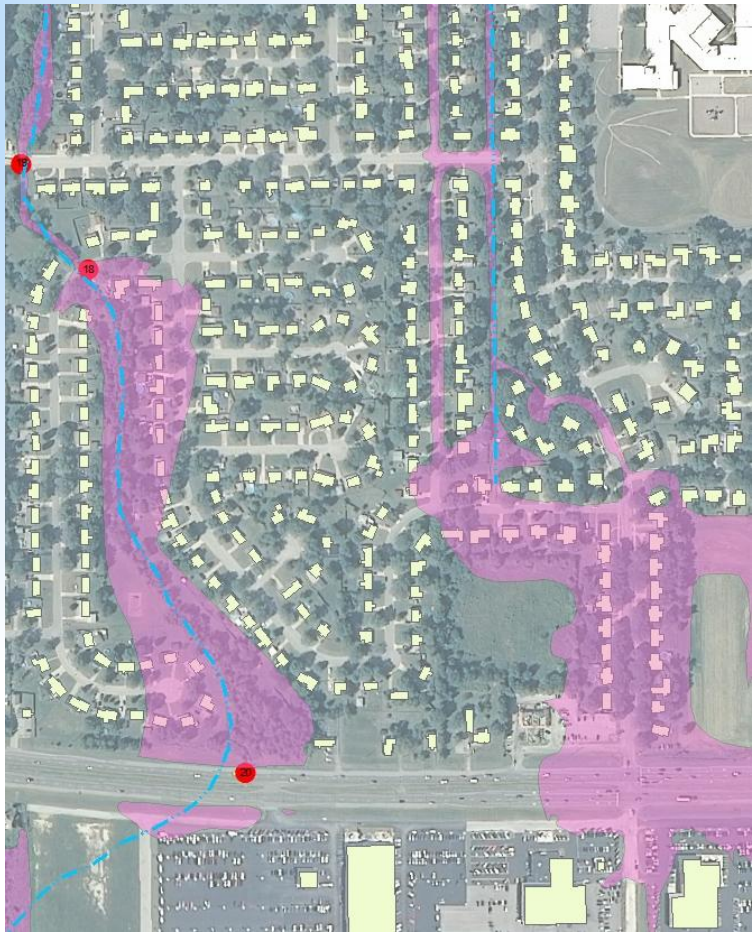
Figure 5. Kaiser Ditch Watershed – Buildings in SFHA and Public roadway Overtopping

Structures at Risk

- FEMA Regulatory Floodplain
  - Repetitive Loss
  - CRS
- CBBEL Inundation Areas

Structures in Regulatory 100-year Floodplain			Structures in CBBEL 100-year Inundation Area	Total Structures in Inundation Area
Floodway	Zone AE	Zone A		
0	1	2	73	73

Table 7. Kaiser Ditch Watershed
Number of Structures in SFHA and CBBEL Delineated 100-year Inundation Area



Delineated Inundation Areas

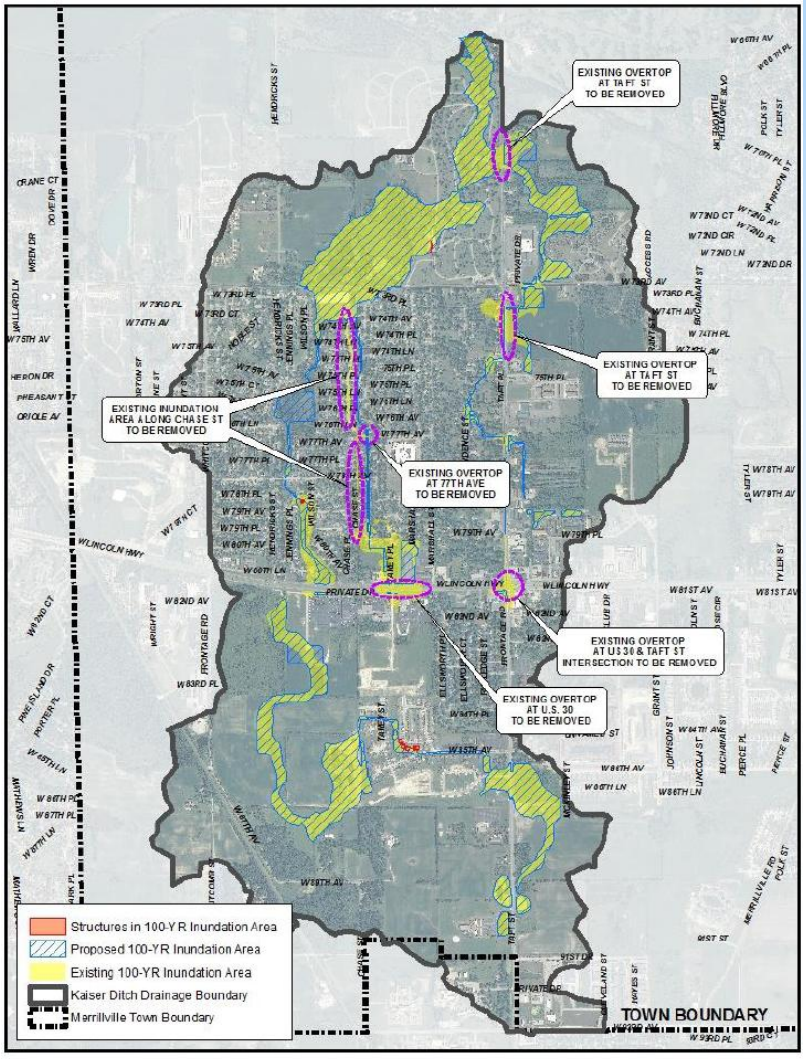
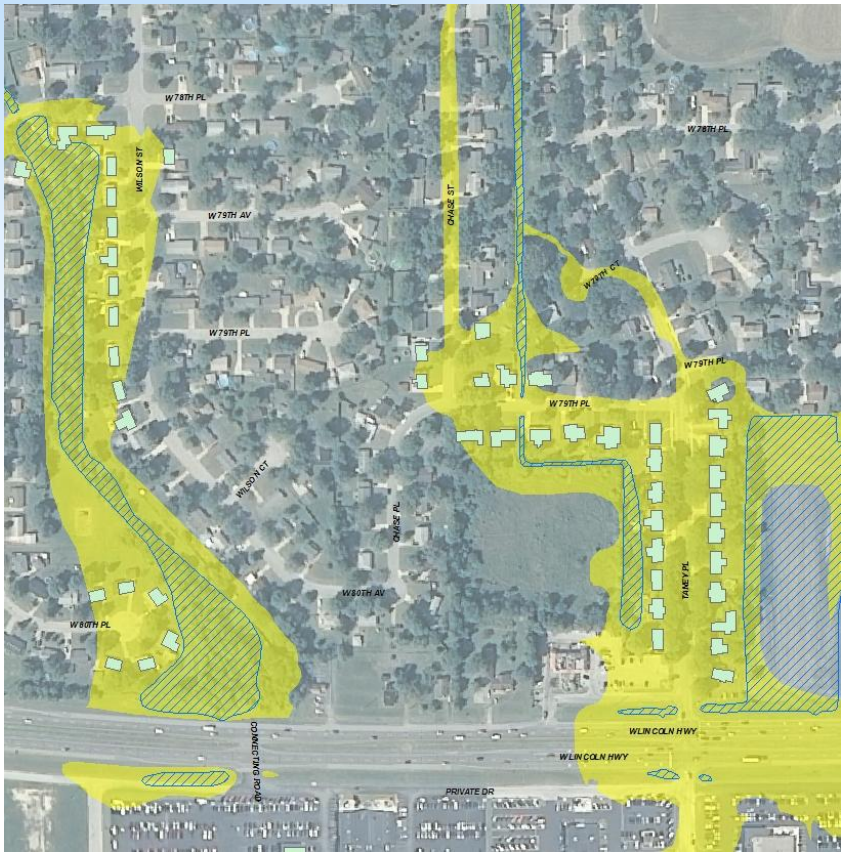


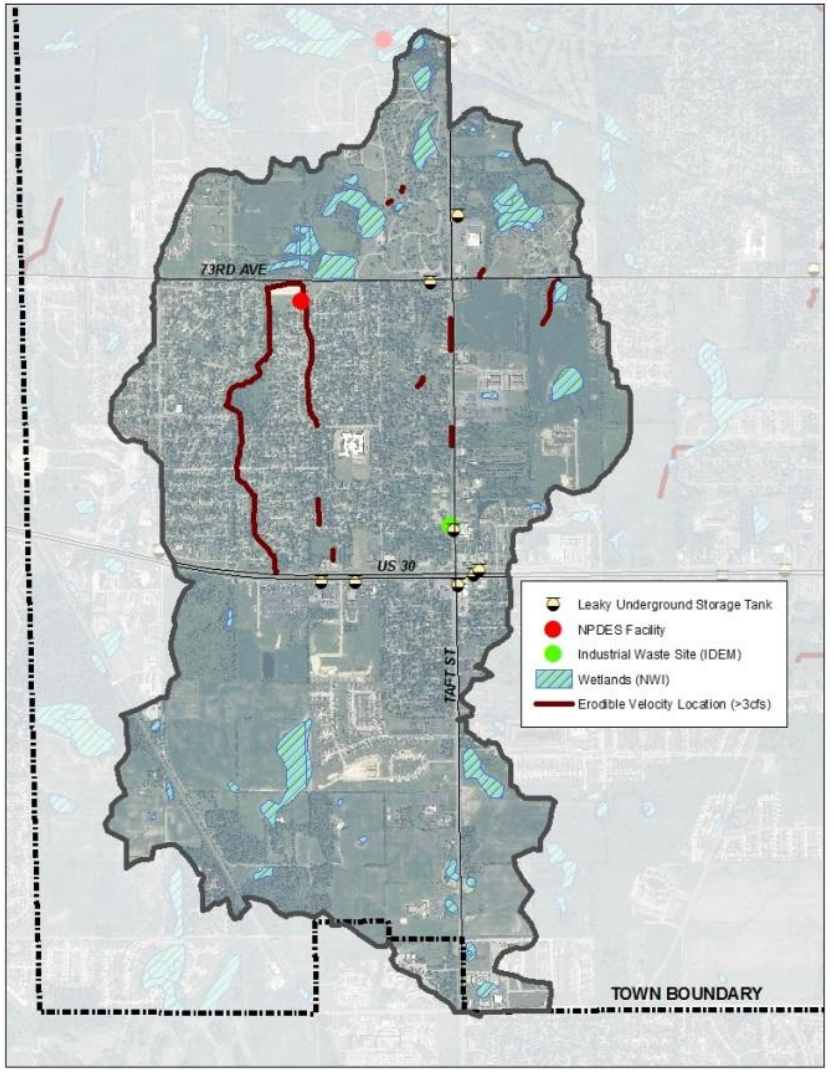
Figure 10. Kaiser Ditch Watershed Proposed CBBEL 100-year Inundation Area

Existing - Proposed = Project Benefit



Water Quality Results

- Stream Erosion
- Hydraulics Model Results
  - Stream Velocity > 3-5 ft/sec
- Recommended Improvements
  - Streambank Stabilization
  - Two-stage ditch
  - Riparian Corridors



Proposed Drainage and Water Quality Projects

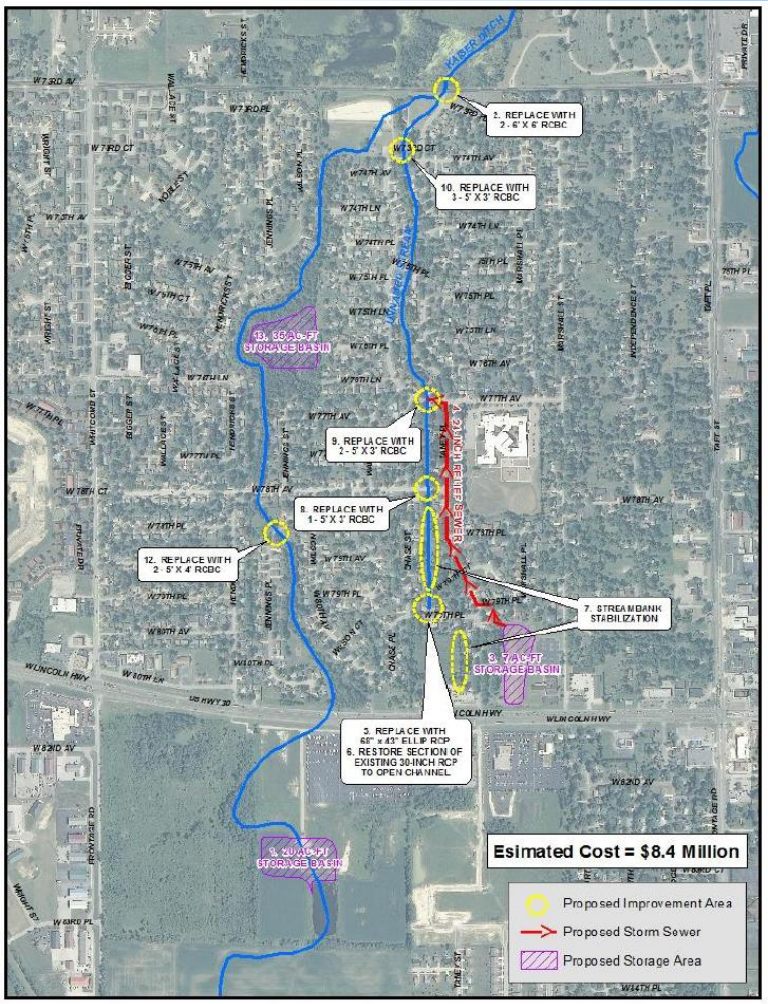


Figure 9. Kaiser Ditch Watershed Proposed Improvements and Storage Areas

- Stream Restoration
- Flood Storage
  - Wetland Basins
- Conveyance Improvements

	Location	Improvement
1	South of US 30	20 ac-ft storage basin
2	73rd Avenue	Replace existing 96" CMP with 2 – 6'x6' RCBC
3	North of US 30 - Trinity Memorial Church	7 ac-ft storage basin
4	Along Taney Place, 77th Avenue to 79th Place	24" relief sewer
5	79th Place	Replace 25"x17" CMP with 68"x43" Ellip
6	77th Place	Restore section of existing 30" to open channel
7	Between US 30 and 78th Avenue	Streambank stabilization
8	78th Avenue	Replace elliptical culvert with 1 – 3'x5' RCBC
9	77th Avenue	Replace elliptical culvert with 2 – 3'x5' RCBCs
10	73rd Place	Replace 4 – 24" CPP culvert with 3 – 3'x5' RCBCs
11	Riparian buffer throughout	Enforcement of an easement
12	Jennings Place	Replace 56"x84" CMP culvert with 2 – 5'x4' RCBCs
13	West of 76th Place	35 ac-ft storage basin

Table 9. Kaiser Ditch Watershed – Proposed Improvements

Prioritization

Rank	Watershed	% of Total Area Studied	% Stormwater Fee Contribution	Number of Residential Parcels	% of Residential Parcels	Number of Structures in Regulatory Floodplain				Town and CBBEL Identified Problems and Concerns						Construction Cost Proposed Improvements
						Floodway	Zone AE	Zone A	Total (FEMA)	CBBEL 100-Yr Inundation Area	Repetitive Loss	Major Public roadway	Minor Public roadway	Erodible Velocity (ft)	Water Quality Hot Spots	
		%	%	#	%	#	#	#	#	#	#	#	#	LF	#	$
1	Kaiser Ditch	15	19	2,290	90	0	1	2	3	73	0	9	13	9,600	10	8.4M
2	Meadowdale Lateral	26	20	2,998	93	9	135	0	144	439	4	4	49	0	3	3.6M
3	Chapel Manor	19	32	1,958	74	18	21	7	46	50	4	3	15	3,700	18	8.7M
4	West	11	5	795	89	0	0	0	0	20	0	0	9	1,500	1	R-Map[A]
5	Turkey Meadows	4	7	1,041	97	0	0	0	0	0	0	0	9	0	0	Ditch[C]
6	North Central TC	6	3	257	73	0	0	0	0	4	0	0	1	250	7	1.7M
7	Broadfield	6	3	153	57	0	2	0	2	14	0	1	5	0	2	R-Map[A]
8	Turkey Creek	9	6	852	87	3	8	0	11	7	0	4	10	0	12[B]	Monitor[B]
9	Northeast Turkey Creek	4	6	758	88	0	0	0	0	8	0	1	7	0	5	2.3M

- Each watershed was ranked by evaluating several variables:
  - % Area
  - # Residential Properties impacted
  - Areas
  - Roadway overtopping

Project Implementation

TAFT STREET DRAINAGE IMPROVEMENT PROJECT

Total Cost = $2.0 M

Total Flood Storage = 20 acre-ft

M'ville kicks off Taft Street drainage project

AUGUST 03, 2012 6:45 PM • BY CHAS REILLY
CHAS.REILLY@NWI.COM, (219) 662-5324

MERRILLVILLE | The largest stormwater project Merrillville has pursued will begin Monday.

Town leaders and officials from Christopher B. Burke Engineering broke ground Friday for the Taft Street drainage project.

Matt Lake, executive director of the town's Stormwater Utility, said Christopher B. Burke Engineering completed the feasibility study for the project, which is expected to significantly reduce flooding on Taft Street and in the Independence Hill subdivision.

Merrillville received $750,000 in state funding for the drainage improvements, which are expected to cost about $2 million, Lake said.

The Lake County surveyor's office provided surveying work, he said.

"It definitely takes a team effort for something like this," Lake said of the project.

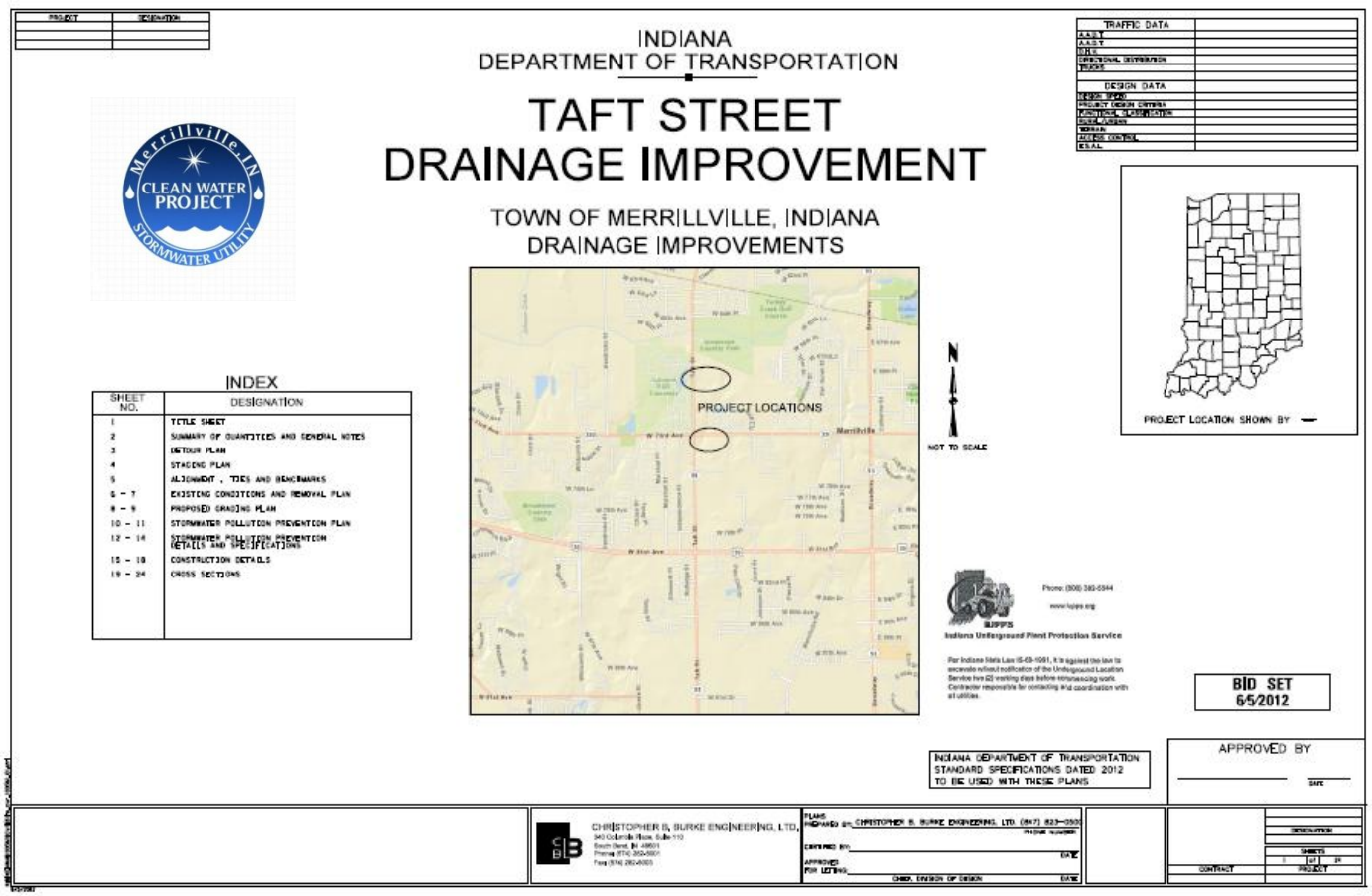
Two new retention ponds will be created and new culverts will be installed during the project.

Town Councilwoman Chrissy Barron said residents in the Independence Hill subdivision are anxious for the drainage improvements to start.

The ponds will be created first. The entire project will be finished next year, town officials said.

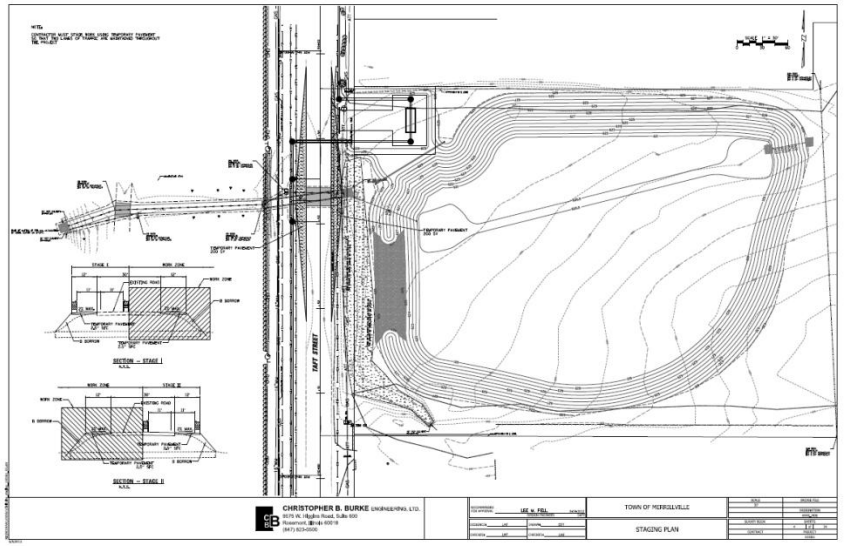
Thomas Burke, of Christopher B. Burke Engineering, commended Merrillville for pursuing the improvements.

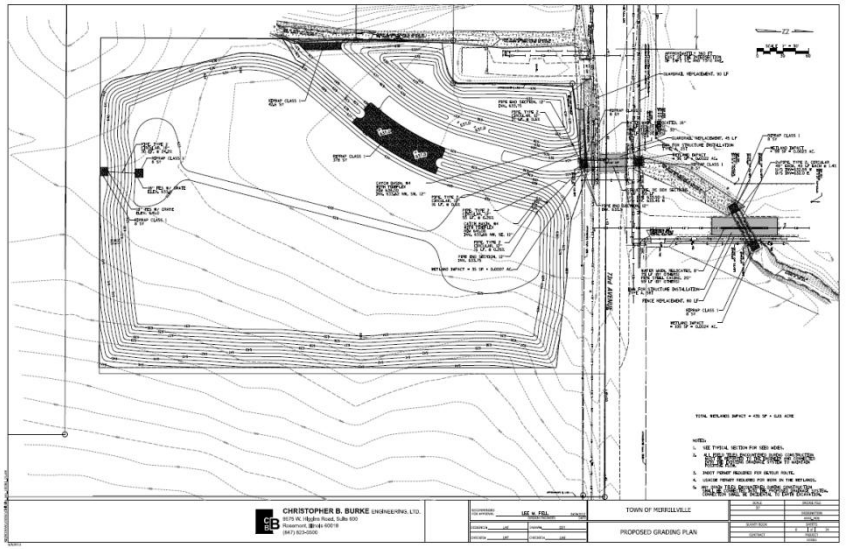
He said many communities have looked at and studied drainage problems, but Merrillville has followed through with its plans.



TAFT STREET DRAINAGE IMPROVEMENTS PROJECT

- Project Components
  - Two flood storage basins
    - Wetland Bottom
    - 20 acre-ft
  - 1,200 linear feet of channel stabilization
  - 3 major culvert crossing
    - 6’ x 4’ Box culverts
  - 1,400 linear feet of 54-inch storm sewer
- Project Coordination
  - Merrillville
  - Lake County Surveyor’s Office
  - InDOT





TOWN OF MERRILLVILLE
STORMWATER UTILITY

Next Steps

- Present final results to Town council as well as public (radio segment)
- Update & share all GIS Geodatabase
- Publish on website
- Seek supplemental funding mechanisms *(TIF, Grants, Cost-share)*
- Pursue each project systematically

Questions?

TOWN OF MERRILLVILLE
DEC. 30
1971

STORMWATER
UTILITY